

ABSTRACT OF THE DISCLOSURE

A MEMS-based fuel cell package and method thereof is disclosed. The fuel cell package comprises seven layers: (1) a sub-package fuel reservoir interface layer, (2) an anode manifold support layer, (3) a fuel/anode manifold and resistive heater layer, (4) a Thick Film Microporous Flow Host Structure layer containing a fuel cell, (5) an air manifold layer, (6) a cathode manifold support structure layer, and (7) a cap. Fuel cell packages with more than one fuel cell are formed by positioning stacks of these layers in series and/or parallel. The fuel cell package materials such as a molded plastic or a ceramic green tape material can be patterned, aligned and stacked to form three dimensional microfluidic channels that provide electrical feedthroughs from various layers which are bonded together and mechanically support a MEMS-based miniature fuel cell. The package incorporates resistive heating elements to control the temperature of the fuel cell stack. The package is fired to form a bond between the layers and one or more microporous flow host structures containing fuel cells are inserted within the Thick Film Microporous Flow Host Structure layer of the package.